Release notes for ENDF/B Development n-044_Ru_106 evaluation

April 26, 2017

- `recent` Warnings:

  1. Fission widths given for non-fissile nucleus, but are zero
     0: Fission?

```
 Calculate Cross Sections from Resonance Parameters (RECENT 2015-1)
 ============================================================================
 Retrieval Criteria----------        MAT
 File 2 Mimimum Cross Section- 1.0000E-10 (Standard Option)
 Reactions with No Background-     Output (Resonance Contribution)
... [303 more lines]
```

- `fudge-4.0` Warnings:

  1. Cross section does not match sum of linked reaction cross sections
     crossSectionSum label 0: total (Error # 0): CS Sum.

```
WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.80%
```

  2. Cross section does not match sum of linked reaction cross sections
     crossSectionSum label 1: (z,n) (Error # 0): CS Sum.

```
WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.11%
```

  3. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
     Section 0 (n + Ru106): / Form 'eval': / Component 0 (Error # 0): Condition num.

```
WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
```

  4. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
     Section 0 (n + Ru106): / Form 'eval': / Component 1 (Error # 0): Condition num.

```
WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
```

  5. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
     Section 1 ((z,n)): / Form 'eval': (Error # 0): Condition num.

```
WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
```

  6. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
     Section 2 (n[multiplicity:'2'] + Ru105): / Form 'eval': (Error # 0): Condition num.

```
WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
```

  7. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
     Section 3 (Ru107 + gamma): / Form 'eval': / Component 0 (Error # 0): Condition num.

```
WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
```

8. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 3 (Ru107 + gamma): / Form 'eval': / Component 1 (Error # 0): Condition num.

```
WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
```

- `fudge-4.0` Errors:

1. Calculated and tabulated Q values disagree.
reaction label 6: n[multiplicity:'2'] + Ru105 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -8028508.880020142 eV vs -8471090. eV!
```

2. Calculated and tabulated Q values disagree.
reaction label 7: n[multiplicity:'3'] + Ru104 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -13938606.4239502 eV vs -1.43862e7 eV!
```

3. Calculated and tabulated Q values disagree.
reaction label 8: n + H1 + Tc105 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -10886161.52865601 eV vs -1.10866e7 eV!
```

4. Calculated and tabulated Q values disagree.
reaction label 9: Ru107 + gamma (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 6109343.066604614 eV vs 5448390. eV!
```

5. Calculated and tabulated Q values disagree.
reaction label 10: n + He4 + Mo102 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -4752288.207672119 eV vs -5192880. eV!
```

6. Calculated and tabulated Q values disagree.
reaction label 11: H1 + Tc106_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -5327419.813278198 eV vs -5520520. eV!
```

7. Calculated and tabulated Q values disagree.
reaction label 12: H2 + Tc105_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -8661595.427719116 eV vs -8776510. eV!
```

8. Calculated and tabulated Q values disagree.
reaction label 13: H3 + Tc104_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -10277167.35722351 eV vs -1.05075e7 eV!
```

9. Calculated and tabulated Q values disagree.
reaction label 14: He4 + Mo103_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 608584.610748291 eV vs -68781.89999999999 eV!
```

- `njoy2012` Warnings:

1. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
groupr...compute self-shielded group-averaged cross-sections (0): GROUPR/conver (0)

```
 ---message from conver---cannot do complete particle production for mt= 16
                          only mf4/mf5 provided
```

2. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
groupr...compute self-shielded group-averaged cross-sections (1): GROUPR/conver (0)

```
 ---message from conver---cannot do complete particle production for mt= 17
                          only mf4/mf5 provided
```

3. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
groupr...compute self-shielded group-averaged cross-sections (2): GROUPR/conver (0)

```
 ---message from conver---cannot do complete particle production for mt= 22
                          only mf4/mf5 provided
```

4. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
groupr...compute self-shielded group-averaged cross-sections (3): GROUPR/conver (0)

```
 ---message from conver---cannot do complete particle production for mt= 28
                          only mf4/mf5 provided
```

5. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
groupr...compute self-shielded group-averaged cross-sections (4): GROUPR/conver (0)

```
 ---message from conver---cannot do complete particle production for mt= 91
                          only mf4/mf5 provided
```